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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,845	02/08/2002	Yun-Bok Lee	8733.592.00	9648
30827	7590	10/06/2003		
MCKENNA LONG & ALDRIDGE LLP 1900 K STREET, NW WASHINGTON, DC 20006				
			EXAMINER CHOWDHURY, TARIFUR RASHID	
			ART UNIT 2871	PAPER NUMBER

DATE MAILED: 10/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

10/067,845

Applicant(s)

LEE, YUN-BOK

Examiner

Tarifur R Chowdhury

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 1-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 12-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Claims 1-11 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 5.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:  
  
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claim 12 recites the limitation "the ohmic contact layer" in line 13. There is insufficient antecedent basis for this limitation in the claim.

***Priority***

5. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Specification***

6. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 12-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (AAPA) in view of Tanaka, USPAT 5,990,987.**

9. The AAPA described (pages 5-9) and shown in Figs 4A-4G, 5A-5G and 6A-6G, a method of forming an array substrate for in-plane switching type liquid crystal display device, the method comprising:

- forming a first metal layer on a substrate;
- patterning the first metal layer using a mask to form a gate line having a gate electrode and a common line having a plurality of common electrodes (page 6, paragraph 0014);
- forming a gate insulating layer (82) on the substrate (1) to cover the patterned first metal layer (page 7, paragraph 0017);
- forming a semiconductor layer (84a) on the gate insulating layer using a mask;
- forming a second metal layer on the gate insulating layer to cover the semiconductor layer;
- patterning the second metal layer using a mask to form a data line having a source electrode, a pixel connecting line connecting a plurality of pixel

- electrodes, and a drain electrode that is spaced apart from the source electrode (page 7, paragraph 0019);
- forming a channel by etching a portion of an ohmic contact layer (84b) between the source and drain electrodes (page 7, paragraph 0020);
  - forming an alignment layer over the substrate to cover the patterned second metal layer (page 9, paragraph 0026); and
  - thermal-treating the substrate having the alignment layer and the source and drain electrode (page 9, paragraph 0028);

The only difference between the method described in the AAPA and the instant invention is that in the AAPA about four masks are used in the method of the AAPA compared to three masks used in the instant invention.

Tanaka discloses a method of forming an array substrate for an in-plane switching type liquid crystal display wherein a first mask is used to form data line having a source electrode, a pixel connecting line connecting a plurality of pixel electrodes, and a drain electrode, a second mask to form semiconductor layer and a third mask to form a gate line having a gate electrode and a common line having a plurality of common electrodes (abstract). Tanaka also discloses that by using reduced photolithographic steps (less masks) to produce an array substrate for a liquid crystal display is advantageous since it reduces cost and improve production yield (col. 2, lines 51-67).

Tanaka is evidence that ordinary workers in the art would find a reason, suggestion or motivation to use less masks to form an array substrate for a liquid crystal display.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the method of manufacturing the array substrate for an in-plane switching type liquid crystal display described in the AAPA by adopting a method wherein less photolithographic steps are used to form the elements as in the instant invention so that production yield is improved and thus cost is reduced, as per the teachings of Tanaka.

Accordingly, claims 12, 20-23 would have been obvious.

As to claims 13 and 14, performing the thermal treatment at a temperature of 200 to 230 degrees centigrade for 3 to 4 hours is common and known in the art and thus would have been obvious to avail a proven technique.

As to claims 15-19, the AAPA described in the present application also discloses that the alignment layer is cured during the thermal treatment and the step of annealing the thin film transistor that includes the source electrode and drain electrodes, the gate electrode and the semiconductor layer and that the curing and annealing are contemporaneous. (page 9, paragraph 0028).

As to claim 24, the AAPA described in the present application also discloses that the method further comprising rubbing the alignment layer (page 9, paragraph 0027).

As to claim 25, using a rubbing direction of 5 to 45 degrees from the common and pixel electrodes when the alignment layer is rubbed is common and known in the art and thus would have been obvious to optimize performance.

***Conclusion***

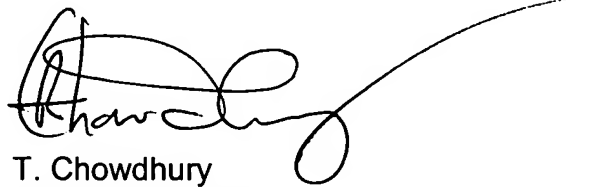
10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tarifur R Chowdhury whose telephone number is (703) 308-4115. The examiner can normally be reached on M-Th (6:30-5:00) Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (703) 305-3492. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

TRC  
September 17, 2003



T. Chowdhury  
Primary Examiner  
Technology Center 2800